

## XII. INDIAN FLIES OF THE SUBFAMILY RHINIINAE.

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The family Muscidae (syn. Calliphoridae) divides into two subfamilies, the Muscinae and the Rhiniinae. The Muscinae are numerous represented in all habitable parts of the globe; but the Rhiniinae are strictly confined to the Old World, with the sole exception of *Pollenia* which has reached America almost certainly through the agency of man.

The material considered in this paper was submitted to me for determination by the Indian Museum. The following synoptic table will enable the identification of the genera of this subfamily known to me, a few genera not represented in the Indian collection being included with their localities. In order to complete this survey of the Rhiniinae, there are appended at the end of the table notes on seven genera probably belonging to this subfamily but not known to me in material, some of which may be found to occur in the Indian region.

### GENERA OF RHINIINAE.

1. Epistoma <i>Rhinia</i> -like, strongly warped forward	2	
Epistoma <i>Phasia</i> -like, projected downward rather than forward...		11
2. Arista plumose, ciliate both above and below	3	
Arista ciliate only above		6
3. Mesoscutum and abdomen finely pubescent, the disk of former without macrochaetae		<i>Borbororhinia</i> , gen. nov.
Mesoscutum with macrochaetae on disk	4	
4. Apical cell widely open		<i>Cosmina</i> , R. D.—Africa.
Apical cell closed or extremely short-petiolate		5
5. Arista long-plumose to tip; frontalia of male pinched out by the nearly contiguous eyes, the parafrontalia reduced to a line		<i>Synamphoneura</i> , Big.
Arista plumose on basal two-thirds or so, but tip bare; frontalia of male reduced to a line, the parafrontalia broadly present and eyes well separated		<i>Eusynamphoneura</i> , gen. nov.—Africa.
6. Apical cell petiolate	7	
Apical cell not petiolate		9
7. Petiole of apical cell rather long and practically in line with third vein		8
Petiole of apical cell short, in line with final course of fourth vein		<i>Idielliopsis</i> , gen. nov.
8. Abdomen as broad as long; male hypopygium large		<i>Chlororhinia</i> , gen. nov.
Abdomen longer than broad; male hypopygium small		<i>Rhinia</i> , R. D.

9.	Apical cell widely open ...	<i>Stomorhina</i> , Rdi.
	Apical cell closed or very narrowly open ...	10
10.	Facial carina rather narrow; male frontalia broadly present throughout ...	<i>Idiella</i> , B. B.
	Facial carina broad, tubercular, fading below; male frontalia pinched out ...	<i>Enidiella</i> , gen. nov.
11.	Arista bare or at most only microscopically pubescent ...	12
	Arista plumose or long-pubescent, ciliate above and below ...	16
12.	Facial carina weak but distinct ...	<i>Metallea</i> , Wulp.
	Facial carina quite absent ...	13
13.	Apical cell widely open ...	14
	Apical cell closed or very narrowly open ...	15
14.	Disk of mesoscutum with macrochaetae ...	<i>Trichometallea</i> , gen. nov.
	Disk of mesoscutum without macrochaetae; male scutellum greatly swollen, far overreaching the base of abdomen ...	<i>Stegosoma</i> , Lw.—Africa.
15.	Preacrostichals present; frontals descending below base of antennae (see note below) ...	<i>Rhyncomya</i> , R. D.—Mediterranean Region.
	No preacrostichals; frontals stopping at base of antennae ...	<i>Rhyncomyiopsis</i> , gen. nov.
16.	No discs on anal segment ...	17
	Erect or suberect, short or long discs on anal segment, at least laterally ...	18
17.	Epistoma very narrow; hypopygium of moderate size ...	<i>Thoracites</i> , B. B.
	Epistoma not unusually narrowed; hypopygia of both sexes greatly enlarged ...	<i>Chloroidia</i> , gen. nov.
18.	Fourth vein evenly rounded at bend, more or less like that of <i>Muscina</i> ...	<i>Strongyloneura</i> , Big.
	Fourth vein not evenly rounded (see <i>S. viridana</i> , sp. n.) ...	19
19.	Arista pubescent about two-thirds way ...	<i>Metalliopsis</i> , gen. nov.
	Arista plumose practically to tip ...	20
20.	Facial carina absent ...	21
	Facial carina present ...	22
21.	Epistoma of ordinary width ...	<i>Synamphoneuropsis</i> , gen. nov.
	Epistoma very narrowed ...	<i>Nitellia</i> , R. D.—Europe.
22.	Epistoma very broad ...	23
	Epistoma narrow ...	24
23.	Short straight erect spines on scutellum ...	<i>Apollenia</i> , Bezzi.—Africa.
	No spines on scutellum ...	<i>Thelychaeta</i> , B. B.
24.	Facial carina narrow, sharp ...	<i>Pollenia</i> , R. D.
	Facial carina rather broad, flattened ...	25
25.	Lateral discs on all abdominal segments ...	<i>Dexopollenia</i> , gen. nov.
	Lateral discs not present on all segments ...	<i>Polleniopsis</i> , gen. nov.

## NOTES.

*Rhyncomya*, R. D.—The characters in the table are drawn from *impavida*, Rossi (syn. *columbina*, Meig.). The genotype is *Musca ruficeps*, Fab., with which *impavida* seems to be congeneric. The main characters of *impavida* are: Facial carina absent; epistoma rather *Phasia*-like, broad and rather strongly protuberant; arista microscopically pubescent; apical cell very narrowly open, almost closed; male eyes nearly contiguous, frontalia pinched out; male hypopygium rather large, claws not very long; bristles on

margin of last two segments; front tarsi of female slightly widened; palpi subphylliform; no differentiated proclinate fronto-orbitals in female.

*Strongyloneura*, Big.—The characters in the table are drawn from *S. nepalana*, sp. n. The genotype is *S. prasina*, Big., Japan, with which *nepalana* seems to be congeneric. The main characters of *nepalana* are: Facial carina absent; epistoma *Phasia*-like, quite broad; arista long-plumose nearly to tip; apical cell open, fourth vein evenly rounded at bend like *Muscina*; macrochaetae marginal, short erect discals in transverse row on anal segment; front tarsi of female moderately widened; palpi club-shaped; female vertex less than eye-width, two strong proclinate fronto-orbitals; strong preacrostichals present; male hypopygium not extremely large but rather conspicuous and elongate; male eyes not contiguous, but frontalia nearly or quite pinched out.

*Arrhinidia*, B. B.—The genotype is *Rhyncomya aberrans*, Sch., China. Would run out at couplet 12 of the table, on character of the arista. Facial carina present; epistoma apparently *Phasia*-like, but little projected; arista short-ciliate above only; apical cell open; male eyes practically contiguous; male hypopygium large; macrochaetae marginal; front tarsi widened; palpi phylliform.

*Stomina*, R. D.—The genotype is *S. rubricornis*, R. D., Europe. A probable synonym is *Gymnostylina*, Mcq. Would run out with *Metallea*. Facial carina weak but probably broad, as description states that the antennae of female are separated thereby; epistoma probably *Phasia*-like, stated to be somewhat rostriform; arista pubescent; apical cell open; macrochaetae of abdomen weak or absent; thorax villous, without macrochaetae on disk.

*Beria*, R. D.—The genotype is *B. inflata*, R. D., Africa. Would run to 14, and probably out with *Stegosoma*. Head inflated somewhat after the style of *Salmacia* (*Gonia*); facial carina absent; epistoma *Phasia*-like; arista bare; apical cell open; male eyes nearly contiguous; macrochaetae weak; palpi subphylliform, widened at tip.

*Pararhynchomyia*, Becker.—The genotype is evidently *P. varifrons*, Beck., Africa, but I have been unable to find the original reference in the literature and get my information from Bezzi's 1911 paper on African "Miodarii Superiori." Would run out at 16 on apical cell petiolate. Facial carina not developed; epistoma *Phasia*-like; arista bare; apical cell petiolate; further characters not stated by Bezzi.

*Idiopsis*, B. B.—The genotype is *I. prasina*, B. B., Mediterranean Region. Would run to 18 apparently. Facial carina absent; epistoma *Phasia*-like, moderately broad; arista long-plumose; apical cell open; male eyes nearly contiguous, the upper facets enlarged; male hypopygium large, claws not very long; macrochaetae marginal on segments one to four; front tarsi of female scarcely widened; palpi club-shaped, probably widened; four or more short, equal proclinate fronto-orbitals in female; female vertex wide.

*Anastellorhina*, Big.—The genotype is *A. bicolor*, Big., Australia. Said by Brauer to be near *Idiopsis*. Would probably run to 18 with *Idiopsis*. Facial carina not developed at all; epistoma probably *Phasia*-like, though face is stated to be strongly concave; arista long-plumose to tip; apical cell open; long marginal macrochaetae on third and anal segments; female with two proclinate fronto-orbitals; very long lower border of head.

*Tricyclopsis*, T.—The genotype is *Rhyncomya dubia*, Mcq., Australia. Placed by Brauer near *Thelychaeta*. Would probably run to 22. Facial carina absent; epistoma probably *Phasia*-like; arista very long-plumose; facialia ciliate over half way up; parafacialia with short bristly hairs; palpi club-shaped. This and the preceding are doubtful members of this subfamily.

#### DESCRIPTIONS AND RECORDS.

The Indian Museum collection sent me contains 243 specimens of Rhiniinae, which are here reported on. The diagnoses of all the genera that follow have been drawn from the genotypes, personally studied by me in material, only five of these genera not being represented in the Indian collection.

#### **Borbororhinia**, gen. nov.

Genotype, *Borbororhinia pubescens*, sp. n.

Facial carina very weak, showing only as a low knife-like edge between antennae; epistoma *Rhinia*-like, but projected only a little below vibrissae; arista thinly plumose, ciliate above and below; apical cell narrowly open, very narrowed on terminal portion; male eyes widely separated, the frontalia wide and continuing full width throughout, the parafrontalia narrow but distinct; male hypopygium moderately large, extruded posteriorly, giving tip of abdomen a tapered form; male claws elongate; thorax and abdomen finely pubescent, abdomen with very fine hair-like marginals; disk of mesoscutum without chaetae, one postsutural behind with a shorter one just in front of it, and one postacrosfichal behind; front tarsi of male very slightly widened; palpi phylliform.

#### **Borbororhinia pubescens**, sp. nov.

Length of body, 5 to 6 mm.; of wing, 4 to 4.5 mm. Two males, Parambikulam, Cochin State, 1,700-3,200 ft., Sept. 16-24, 1914 (*F. H. Gravely*).

Pallid testaceous. Frontalia, first two antennal joints and palpi obscure fulvous; third antennal joint pale fulvous. Parafrontalia and upper half of parafacialia thinly silvery, lower half of latter shining black. Facial plate and facialia polished, the latter with large shining black area confluent with that of parafacialia. Epistoma shading to brown on sides. Cheeks with shining dark brown or black area. Sternum, pleurae and anterior half

or so of venter very pale yellowish or straw-colour; mesoscutum, scutellum, abdominal tergum and posterior half of venter fulvous, shaded more or less with fuscous; mesoscutum showing thinly silvery, with four brown or black vittae, the two inner ones widely separated. Legs pale fulvous, the tarsi dusky except the whitish-yellow metatarsi. Pile of body short, black, very soft and fine. Wings slightly tinged with smoky-yellow, more so on costal portion. Tegulae smoky-yellow.

Holotype in Ind. Mus. Paratype, No. 21022 U.S. Nat. Mus.

Two apparently new genera near *Borbororhinia* are represented in the Indian collection by two male specimens from Margherita, Assam, and Mergui, Lower Burma (*W. Doherty*). They are not in sufficiently good state of preservation to serve as holotype specimens; hence I do not name them.

### **Cosmina**, R. D.

(Syn. *Seseromya*, Rdi.)

Genotype, *Musca punctulata*, Wied.—Africa, (syn. *Cosmina fuscipennis*, R. D.).

Facial carina present but weak; epistoma *Rhinia*-like but not very strongly projected; arista plumose on both sides, tip more or less bare; apical cell widely open; male eyes nearly contiguous, the frontalia completely pinched out; male hypopygium large; weak macrochaetae on anal segment, practically only marginal.

I am unable to refer any of the forms in the Indian collection to this genus. Indian and East Indian species have been referred here by Walker and Bigot, probably incorrectly.

### **Synamphoneura**, Bigot.

Genotype, *S. cuprina*, Big.—Java.

Facial carina not developed; epistoma *Rhinia*-like, broad; arista long-plumose; apical cell closed in margin or extremely short-petiolate; male eyes nearly contiguous, frontalia pinched out; male hypopygium rather large, claws elongate but not very strong; strong macrochaetae on margin of anal segment, weak ones on margins of other segments; front tarsi not widened in either sex, female claws very short and weak; palpi phylliform but not very wide.

### **Synamphoneura cuprina**, Big.

Fourteen specimens, both sexes, from Java, Assam and Burma.

### **Eusynamphoneura**, gen. nov.

Genotype, *Idia seriepunctata*, Lw.—Mozambique, (syn. *Cosmina depressa*, Karsch).

Facial carina very weak in the male, almost undeveloped in the female; epistoma *Rhinia*-like, broad; arista plumose on both

sides, except tip; apical cell closed in the margin or very short-petiolate; male eyes not contiguous, well separated, the parafrontalia broad, the frontalia reduced to a line; male hypopygium not large, of moderate size; weak marginal macrochaetae on anal segment, and bristle rows on margins of second and third segments.

This genus appears to be confined to East Africa.

#### *Idielliopsis*, gen. nov.

Genotype, *Idielliopsis similis*, sp. n.

Facial carina broadly developed, widely separating the antennae; epistoma *Rhinia*-like; arista ciliate on upper side only; apical cell short-petiolate, the petiole about half as long as small crossvein and in line with final course of fourth vein; male eyes nearly contiguous, the frontalia completely pinched out; male hypopygium small; weak bristle-like macrochaetae on margin of anal segment; female vertex about one-fifth of head-width.

#### *Idielliopsis similis*, sp. nov.

Length of body, 9 to 9.5 mm.; of wing, 6.5 to 7 mm. Three males: Dhikala, Naini Tal District, United Provinces of Agra and Oudh, April 22, 1908 (*R. H.*); Mazbat, Mangaldai District, Assam, Oct. 11-15, 1910 (*S. Kemp*); Paresnath, Chota Nagpur, 4,000-4,400 ft., April 13, 1909 (*N. Annandale*); one female, Katihar, Purneah District, Bihar, March 23, 1909 (*C. Paiva*).

Differs in coloration from *Idiella mandarina*, Wd. practically only as follows: Less black on abdomen, male showing same on anal segment and posterior third to half of preceding segment in addition to the median vitta; the female lacks the black entirely, even the median vitta being lost. The red of abdomen is somewhat darker, rather reddish-orange. Mesoscutum and scutellum quite distinctly dark green. Tegulae deeper yellowish. Legs wholly brown to black, only the metatarsi lighter; the bases of tibiae light brown.

Holotype (male) and allotype (female) in Ind. Mus. Paratype, No. 21023 U.S. Nat. Mus., male.

#### *Rhinia*, R. D.

(Syn. *Beccarimyia*, Rdi.)

Genotype, *R. testacea*, R. D.—Mauritius, (syn. *Becc. glossina*, Rdi.).

Facial carina broad; epistoma strongly warped forward, well projected; arista ciliate above only; apical cell petiolate, the petiole rather long and about in line with third vein; male eyes nearly contiguous, the frontalia practically pinched out, and the parafrontalia reduced almost to a line; male hypopygium small; no abdominal macrochaetae, only bristles; front tarsi widened in both sexes; palpi phylliform.

***Rhinia testacea*, R. D.**

Four specimens, from Bombay, Puri, Malavni, and Ceylon (5,291 ft.). The species occurs from North Africa through the Orient to the Pacific Is.

***Chlororhinia*, gen. nov.**

Genotype, *Chlororhinia viridis*, sp. n.

Facial carina narrow, weak; epistoma *Rhinia*-like, but produced beyond vibrissal angles only about as far as length of second antennal joint; arista very short-ciliate, merely pubescent, on upper side only; apical cell petiolate, the petiole as in *Rhinia*; male eyes nearly contiguous, the frontalia pinched out, the parafrontalia reduced to a line; male hypopygium rather large, abdomen rather wider on first two segments than its length on median line; no abdominal macrochaetae; front tarsi not widened; pollinose-pilose band of cheeks and pleurae wanting.

***Chlororhinia viridis*, sp. nov.**

Length of body, 4 mm.; of wing, 3 mm. One male, Shillong, Khasi Hills, Assam (*H. H. Godwin-Austen*); also a specimen with head and abdomen missing, but evidently this species, Ukhrul, Manipur, 6,400 ft. (*W. Pettigrew*).

Wholly bright metallic green in body and head integument, including clypeus and epistoma. Frontalia black, antennae pale fulvous, palpi blackish, base of haustellum metallic green. Parafacialia silvery pollinose on upper end, opposite second antennal joint. A thin beard, some pleural hair and hairs on edge of scutellum tawny. Mesoscutum, scutellum and tergum of abdomen blackish-punctate, the dots marking origins of microchaetae; no thoracic vittae. Abdominal tergum blackish on disk, extended widely along the three segmental incisures and more or less confluent; the hairs of this region smaller and more closely placed, the blackish dots on sides of abdomen larger and less closely placed. No dot-punctation on head. Legs very pale fulvous, the femora brownish except front pair which are metallic green. Wings faintly tinged with smoky-yellowish throughout. Tegulae a little more deeply tinged with fuscous.

Holotype in Ind. Mus.

***Stomorhina*, Rdi.**

(Syn. *Idia*, Wied. preocc.)

Genotype, *Musca lunata*, Fab.—Madeira, (syns. *Idia cinerica*, R. D., *I. fasciata*, Meig., *Stomorhina maculata*, Rdi.).

Facial carina broadly developed; epistoma *Rhinia*-like; arista ciliate above only; apical cell widely open; marginal bristles on last two abdominal segments; male eyes actually contiguous; male mesoscutum, scutellum and abdomen with thin erect black

pile, that of scutellum longer than that of thorax, the female lacking such pile; male hypopygium not large, claws not very long; parafacialia hairy.

#### ***Stomorphina lunata*, Fab.**

Three males and eight females, from Darjiling (7,000 ft.), Sukhwani (Nepal), Coonoor (Nilgiris), Horai (Naini Tal, west base of Himalayas), and Maritime Alps.

#### ***Idiella*, B. B.**

Genotype, *Idia mandarina*, Wied.—China, (syn. *Idia nigricauda*, Bigot).

Facial carina well developed, sharp; epistoma *Rhinia*-like; arista long-ciliate on upper side only; apical cell closed or narrowly open; male eyes well separated, the frontalia broadly persistent throughout; male hypopygium large, claws long; weak macrochaetae on margin of anal segment.

#### ***Idiella mandarina*, Wied.**

Twenty-six specimens, both sexes, from Burma, Cochin State, Assam, Calcutta, and various localities in India from sea-level up to 6,400 feet.

#### ***Euidiella*, gen. nov.**

Genotype, *Musca discolor*, Fab.—Java, (syns. *Stomorphina muscina*, Rdi., *S. scalaris*, Big.).

Facial carina developed, broad, tubercle-like, widely separating the antennae, fading out below; epistoma *Rhinia*-like, broad; arista thinly long-ciliate above only; apical cell closed in margin or narrowly open; male eyes contiguous, even the parafrontalia practically pinched out; male hypopygium small, claws short; abdominal macrochaetae not developed; front tarsi widened in both sexes.

#### ***Euidiella discolor*, Fab.**

Twenty-seven specimens, both sexes, from Java, Lower Burma, Assam, Nepal, Western Ghats, Sind, and various localities in India from sea-level at Calcutta up to 7,000 feet in the Himalayas. One male was taken at light, and two males were taken hovering in the air.

The yellow of second abdominal segment may be either uninterrupted on the median line, as described by Rondani under the name *muscina*, or rather broadly interrupted on same.

#### ***Euidiella quadrinotata*, Big.**

(*Idia quadrinotata*, Big.—Borneo).

Two females, Mujang, Sarawak, Borneo, July 12, 1910 (C. W. Beebe). This is evidently a good species. It is closely allied

to *discolor*, F., from which it differs in having the abdomen black except the narrow base and the restricted lateral spots on second and third segments. It is also a little more narrowed in form.

***Euidiella unicolor*, sp. nov.**

Length of body, 5.5 to 6.25 mm.; of wing, 4 to 4.5 mm. Three females, Mujang, Sarawak, Borneo, July 12, 1910 (*C. W. Beebe*); Parambikulam, Cochin State, 1,700-3,200 ft., Sept. 16-24, 1914 (*F. H. Gravely*); and Mangaldai District, N.E., Assam-Bhutan Frontier, Dec. 26, 1910 (*S. W. Kemp*).

Differs from *quadrinotata*, Big., by the still more narrowed form, and the wholly dark green abdomen. The legs and antennae are darker also. The second and third specimens mentioned above have the front appreciably shorter and broader than in the Bornean specimen.

Holotype in Ind. Mus., Sarawak. Paratype, No. 21025 U.S. Nat. Mus., Assam-Bhutan Fr.

***Euidiella purpurea*, sp. nov.**

Length of body, 8 to 9 mm.; of wing, 6 to 7 mm. Three males and two females: Three on board ship, 10 miles off Masulipatam, Madras Coast, June 4-5, 1908 (*C. Paiva*); one Sukna, Eastern Himalayas, 500 ft., July 1, 1908 (*N. Annandale*); and one Kurseong, Eastern Himalayas, 5,000 ft., August 13-15, 1909 (*J. T. Jenkins*).

Shining black, with greenish thorax. Parafrontalia honey-combed with yellowish pollen. Parafacialia with silvery or yellowish bar across upper end, extending over upper part of facialia, and a yellowish fleck below on cheek-grooves next eye. Antennae light brownish. The usual broad stripe of pale yellow pollen and pile on cheeks and pleurae. Mesoscutum and scutellum metallic greenish-cupreous, light golden pollinose, punctate with blackish. Abdomen with decided purplish-cupreous shade on sides and covering whole of anal segment. Venter pollinose, with punctations. Legs subfulvous; femora black with purplish tinge, especially front ones; tips of tarsi dusky. Wings nearly clear, base and especially tips smoky. Tegulae smoky-yellow.

Holotype (male) and allotype (female) in Ind. Mus. Paratypes, No. 21026 U.S. Nat. Mus., male and female.

This species is evidently similar to *Idia cervina*, O.S., of Amboyna.

***Metallea*, Wulp.**

Genotype, *Metallea notata*, Wulp.—Java, (syn. *Rhyncomya diversicolor*, Big.).

Facial carina but little developed, flat and weak; epistoma *Phasia*-like, not very broad, not strongly protuberant; arista finely pubescent; apical cell well open; male eyes nearly contiguous, the

frontalia completely pinched out; male hypopygium rather large; marginal row of macrochaetae on last three segments.

### *Metallea notata*, Wp.

Twenty-four specimens, both sexes, from Java, Puri, Shillong, Port Blair, and other Indian localities including on board ship 10 miles off the Madras coast. East African specimens appear to be conspecific with the Indian specimens.

### *Trichometallea*, gen. nov.

Genotype, *Trichometallea pollinosa*, sp. n.

Facial carina absent; epistoma *Phasia*-like; arista bare; apical cell widely open; male eyes nearly contiguous, the parafrontalia reduced to a line; male hypopygium small; abdominal macrochaetae bristle-like, suberect, marginal on last two segments, at sides of other segments, some discals on anal segment; front tarsi of female slightly widened, those of male not so; palpi phylliform, not very broad; mesoscutum, scutellum and abdomen pilose in male, but not in female.

### *Trichometallea pollinosa*, sp. nov.

Length of body, 5.25 to 6.5 mm.; of wing, 5.75 to 6 mm. Two males and one female: One male Songara, Gonda District, United Provinces, March 3-5, 1907; the others Umballa, North-west India, 900 ft., May 8-13, 1905 (*E. Brunetti*).

Pale yellowish, thinly silvery pollinose. Head pale luteous; antennae, frontalia and palpi fulvous. Thorax greenish-cupreous, pleurae thickly pale yellowish pollinose. Mesoscutum and scutellum rather thickly silvery pollinose. Abdomen pale yellowish; median vitta and hind margins of segments blackish, either broadly, narrowly or irregularly, the whole more or less thickly silvery pollinose shading to pale golden. Legs blackish or brownish, hind tibiae fulvous. Wings clear. Tegulae nearly white.

Holotype (male) and allotype (female) in Ind. Mus. Paratype, No. 21027 U.S. Nat. Mus., male.

### *Stegosoma*, H. Loew.

Genotype, *Stegosoma vinculatum*, H. Loew.—Orange Free State, Africa.

Facial carina absent; epistoma *Phasia*-like, not very broad; arista bare; apical cell widely open; male eyes contiguous, the parafrontalia nearly pinched out; male hypopygium of moderate size, the scutellum greatly swollen and over-reaching the two basal segments of abdomen; no abdominal macrochaetae, the abdomen swollen, the anal segment bare on disk; front tarsi widened; palpi phylliform.

This genus appears to be confined to Africa.

**Rhynchomyiopsis**, gen. nov.

Genotype, *Rhynchomyiopsis indica*, sp. n.

Facial carina not developed; epistoma *Phasia*-like; arista practically bare; apical cell practically closed in margin quite far before wing-tip; weak bristles on margins of third and anal segments; front tarsi not widened; palpi phylliform; female vertex wider than eye; no fronto-orbitals in female save small reclinate ones; no preacrostichals; all head and other macrochaetae very weak; frontals stopping at base of antennae; costal spine strong; two sternopleurals, and only one postsutural. Male not known.

**Rhynchomyiopsis indica**, sp. nov.

Length of body, 6 mm.; of wing, 4.5 mm. One female, Karachi, Sind, Western India, July 28, 1889 (*Cumming*).

Head, scutellum, abdomen and legs rather pale fulvous, including frontalia, antennae and palpi; the abdomen subrufous from hind half of second segment to tip. Parafrontalia, parafacialia and cheeks very thinly silvery; three polished subround black spots near eye on each side; the largest about middle of parafacialia, one on front half of parafrontalia, the smallest one on cheeks. Thorax light metallic gold-green, the humeri fulvous. Wings scarcely infuscate. Tegulae nearly white.

Holotype in Ind. Mus.

**Thoracites**, B.B.

Genotype, *Musca abdominalis*, Fab.—East Indies.

Facial carina absent; epistoma *Phasia*-like, very narrow, the vibrissal angles constricting the facial plate far above oral margin; arista long-plumose to tip; apical cell narrowly open; male eyes not contiguous, about or fully as far apart as length of second antennal joint; male hypopygium rather large, claws very elongate; macrochaetae strong, suberect, on margins of last two segments, discal and marginal on sides of second and third segments, marginal on sides of first segment; palpi phylliform, but rather narrow; very strong, long costal spine; female with very narrow frontalia, male with same scarcely or not at all showing; female with two strong proclinate fronto-orbitals and one reclinate, male with none of either; female anal segment with close-set row of strong marginal spines, in addition to the regular marginals which thus become practically submarginal.

**Thoracites abdominalis**, Fab.

Twenty-one specimens, both sexes, from Ceylon, Puri and Madras. The species may be known by the green thorax and fulvous to rufous abdomen, with the under edges of the intermediate abdominal segments more or less widely black.

**Chloroidia**, gen. nov.

Genotype, *Chloroidia flavifrons*, sp. n.

Facial carina not developed; epistoma *Phasia*-like, rather narrow; arista ciliate on both sides nearly to tip; apical cell very narrowly open, almost closed, the tip of cell narrowed; male eyes nearly contiguous, the frontalia pinched out; male hypopygium extremely large, that of female large and broad; macrochaetae bristle-like on margins of last two segments; front tarsi of female widened, those of male not so; intermediate abdominal segments of male extremely shortened, the two hypopygial segments greatly enlarged and almost as long as the four preceding segments; fifth sternite of male with spine-brush, the sixth sternite excessively broadened and with spine-brushes on each side.

**Chloroidia flavifrons**, sp. nov.

Length of body, 5 to 5.5 mm.; of wing, 4 to 4.5 mm. One male, Mergui, Lower Burma (*W. Doherty*); one female, Chalakudi, Cochin State, Sept. 14-30, 1914 (*F. H. Gravely*).

Head light golden pollinose, parafrontalia more deeply golden; frontalia and large spot on each cheek black; antennae and palpi fulvous-yellow. Facial plate and facialia not pollinose, shining, tinged black in centre of clypeus and on vibrissal angles. Thorax and scutellum a very bright burnished emerald-green, thinly yellowish pollinose. Abdomen nearly as bright green; in female shading to cupreous at tip and more or less blackish on disk of tergum, in male dusky on tergal disk. Male hypopygium wholly purplish-brown; that of female nearly black, with some purplish tinge. Legs subfulvous; front femora bright green, others more black; tarsi darker distally. Wings faintly infusate, or at least so on costa and tip. Tegulae tawny-whitish to yellowish.

Holotype in Ind. Mus., female; allotype, male.

**Strongyloneura**, Big.

The main characters of this genus as interpreted by me have been already given. My reference of the following species to *Strongyloneura* is provisional. They seem almost certainly, however, to be congeneric with the genotype (*prasina*, Big.—Japan), which I cannot identify positively in material but which, according to the description, is a member of the *Rhyncomya* group with strongly rounded fourth vein. The supplementary characters given by Brauer (*Sitz. Ak. Wiss., math.-nat. Cl., CVIII, 519*) also agree.

**Strongyloneura nepalana**, sp. nov.

Length of body, 8.5 mm.; of wing, nearly 7 mm. One female, Thamaspur, Nepal, Feby. 18-20, 1908.

Metallic green; slightly cupreous, especially on abdomen. Parafrontalia, parafacialia and cheeks pale golden pollinose. Fron-

talia brown; antennae and palpi rufofulvous; clypeus and facialia shining yellowish-fulvous. Thorax and scutellum brighter green than abdomen, all with thin coat of silvery pollen. Legs brownish; tibiae tinged with fulvous; femora black, front pair greenish. Wings clear; apical cell rather widely open, though much narrowed at tip. Tegulae nearly white. Parafacial hairs yellowish, thick.

Holotype in Ind. Mus.

A male from Bhim Tal (4,500 ft.) seems to belong here; it is certainly congeneric, and I have drawn the male characters from it as already given, but the apical cell is more narrowly open, and the hairs of parafacialia are blackish. Also fifteen other specimens, both sexes, from Calcutta, Sukna, Assam and Burma appear to be this species, though the fourth vein is not so broadly rounded in all of them. Some have the wings lightly infuscate, and the hairiness of the parafacialia is variable in degree, though quite uniformly yellowish.

#### *Strongyloneura nebulosa*, sp. nov.

Length of body, 7 to 7.5 mm.; of wing, 6 to 6.5 mm. One male and one female, Margherita, Assam; and Mergui, Lower Burma (*W. Doherty*).

Differs from *nepalana* as follows: Whole body dark cupreous-purplish, with more or less green reflections. The female shows more green. Head testaceous, antennae and palpi fulvous. Parafacialia and parafacialia pale yellowish to golden pollinose. Wings strongly smoky-infuscate across apical half and on extreme basocostal region. Tegulae yellow, upper scale more whitish. Apical cell narrowly open. Parafacial hairs sparse, blackish.

Holotype in Ind. Mus., male; allotype, female.

#### *Strongyloneura viridana*, sp. nov.

Length of body, 7 to 10.5 mm.; of wing, 6 to 8.5 mm. Five females: one Sadiya, North-east Assam, Nov. 27, 1911 (*S. Kemp*—Abor Exped.); four Calcutta, Aug. 27, Sept. 26, Oct. 2, 1907.

Entire body except head brilliant metallic green, with cupreous reflections especially on thorax. Head yellowish; pale golden pollinose on parafacialia, parafacialia, facialia, cheeks and orbits; occiput more ashy. Frontalia brown; antennae, facial plate and palpi fulvous. Thorax thinly silvery pollinose, the scutellum and abdomen showing rather less so except on venter. Legs brownish-rufous; femora black, the front and middle pairs decreasingly green. Wings and squamae usually infuscate with smoky-yellow, the anal region less so, the squamulae whitish. Fourth vein less evenly rounded. The abdomen shows a faint purplish median vitta; and is more or less tinged with cupreous, sometimes wholly so. Parafacial hairs partly or wholly blackish.

Holotype in Ind. Mus. Paratypes, No. 21028 U.S. Nat. Mus.

Thirty-five other specimens, both sexes, from Calcutta, Sikkim and Assam (Sylhet), appear to be this species, but show fourth vein often bent rather suddenly and not evenly rounded. The parafacial hairs are quite uniformly blackish.

It is quite impossible to decide the distinctness of these specimens and those mentioned under *nepalana* without investigation of the forms in their native habitats and dissections of fresh material. The genitalia can not be satisfactorily prepared in the material before me.

#### *Strongyloneura coeruleana*, sp. nov.

Length of body, 8.5 mm.; of wing, 6.75 mm. One female, Port Blair, Andaman Is., Feb. 15 to Mch. 15, 1915 (*S. Kemp*).

Differs from *viridana* as follows: Face and antennae rather testaceous; the pollen of head grayer, less golden. Disk of abdominal tergum broadly purplish-blue; the scutellum same colour, also the humeri and the central hind portion of mesoscutum. Wings clear, fourth vein broadly rounded. Tegulae nearly pure white. Parafacial hairs rather blackish.

Holotype in Ind. Mus.

#### *Metalliopsis*; gen. nov.

Genotype, *Metalliopsis setosa*, sp. n.

Facial carina weak, flat, separating antennae; epistoma *Phasia*-like, rather narrow; arista very short-plumose or long-pubescent about two-thirds way; apical cell widely open; macrochaetae marginal on last two segments, with irregular discals on anal segment; front tarsi a little widened; palpi phylliform, moderately wide; female front rapidly widening from vertex, parafrontalia thickly bristled outside of frontal row; parafacialia hairy above. Male unknown.

#### *Metalliopsis setosa*, sp. nov.

Length of body, 7 (abdomen recurved) to 8.5 mm.; of wing, 7 to 7.5 mm. Three females: Kurseong, Eastern Himalayas, 5,000 ft., July 6, 1908 (*N. Annandale*); and Siliguri, base of Eastern Himalayas, July 18-20, 1907.

Head rufescent, the parafrontalia showing obscurely green beneath the yellowish pollen; a black spot on parafacialia; third antennal joint and extreme tips of palpi dusky. Thorax and scutellum bright metallic green, with thin coat of silvery pollen; some thin long yellow pile on pleurae and humeri. Abdomen fulvous-rufous, with black median vitta; anal segment metallic cupreous-green. Edge of third segment and spot on side of second segment metallic greenish. Legs brownish-rufous; femora black with metallic green tinge, especially front ones. Wings and tegulae yellowish-infusate.

Holotype in Ind. Mus. Paratype, No. 21029 U.S. Nat. Mus.

**Synamphoneuroopsis**, gen. nov.

Genotype, *Synamphoneuroopsis viridis*, sp. n.

Facial carina absent; epistoma *Phasia*-like, not very wide; arista long-plumose nearly to tip; apical cell open; male eyes not contiguous, separated by distance equal to half or more of the length of second antennal joint, the frontalia reduced to a line; male hypopygium moderately large, claws moderately elongate; macrochaetae not very strong, marginal on last three segments, with irregular suberect discals on anal segment; front tarsi of female a little widened, those of male not so; palpi phylliform, moderately wide; abdomen broader than in *Synamphoneura*.

**Synamphoneuroopsis viridis**, sp. nov.

Length of body, 6 to 8 mm.; of wing, 4.5 to 6.5 mm. Eighteen specimens, both sexes: nine from Sukhwani, Nepal Frontier, Feb. 15-16, 1908; three from Muttra, United Provinces, July 24, 1905 (*E. Brunetti*); two from Allahabad, United Provinces, August 12-13, 1909 (*B. Lord*); one from Motisal, Garhwal District, base of Western Himalayas, March 5, 1910; one from Amangarh, Bijnor District, United Provinces, Feb. 24, 1910; and two from Anwarganj, Cawnpore District, United Provinces, Oct. 1-13, 1911 (*J. W. C.*).

Metallic cupreous-green; the coppery showing on dorsal portions, and especially on tip of abdomen. Front and face silvery-yellow pollinose; a shining brown spot near middle of parafacialia, a dusky area on cheeks, and another at front end of parafrontalia. Pollen of head of female more golden. Frontalia light brown; antennae and palpi fulvous to rufous. A thin silvery bloom over the metallic green of body. Obscure dark median vitta on abdomen. Legs brownish-rufous; femora blackish, more or less metallic green especially the front ones. Wings and tegulae distinctly smoky-yellowish, often the costal border of wing more infuscate.

Holotype (female) and allotype (male) in Ind. Mus. Paratypes, No. 21030 U.S. Nat. Mus., male and female.

**Nitellia**, R. D.

Genotype, *Musca vespillo*, Fab.—Europe.

Facial carina absent; epistoma *Phasia*-like, very narrowed; arista long-ciliate above, with only a few cilia below in middle; apical cell closed or very short-petiolate; male eyes nearly contiguous, the frontalia reduced to a line or nearly pinched out; male hypopygium rather large; macrochaetae like *Pollenia*; mesoscutum without yellow pile, and with pronounced flat discal impression.

This genus appears not to reach India.

**Apollenia**, Bezzi.

Genotype, *Pollenia nudiuscula*, Big.—Port Natal, Africa.

Facial carina flattened, wide, weak, broadly separating the antennae; epistoma *Phasia*-like, broad; arista long-plumose to

tip; apical cell widely open; macrochaetae marginal on last three segments, with irregular discals on anal segment; front tarsi of female widened; palpi phylliform, but not very broad; scutellum with erect short straight spines.

This genus appears to be confined to Africa.

### **Thelychaeta, B. B.**

Genotype, *Thelychaeta chalybea*, B. B.—Borneo.

Facial carina broad, but flattened; epistoma *Phasia*-like, broad and very long; arista wholly long-plumose to tip; apical cell widely open; male eyes almost contiguous, the frontalia nearly or quite pinched out, the parafrontalia reduced to a line; male hypopygium not very large, claws not very long; macrochaetae like *Pollenia*; front tarsi of female much widened, those of male scarcely so; palpi phylliform; female with two strong proclinate fronto-orbitals and one reclinate, male with none of either. No straight erect spines on scutellum.

### **Thelychaeta chalybea, B. B.**

One female, labelled "no history." This specimen differs from the description by the third antennal joint being scarcely twice the length of the second. It is strongly bluish, and the abdomen shows practically no pollen. The tegulae are strongly infusate with brownish, the wings but faintly so. The form is evidently congeneric with *viridaurea*, Wd., and is doubtfully referred to *chalybea*, B. B.

### **Thelychaeta viridaurea, Wied.**

One male and six females of this interesting species are from Mergui, Lower Burma; Ghumti, Eastern Himalayas, 1,800-3,500 ft.; Sadiya, North-east Assam; and Soondrijal, Nepal; three others being labelled "no history." Wiedemann's characterization, though very brief, seems quite unmistakable. Brauer and Bergenstamm have given additional characters (*Musc. Schiz.*, III, 179). Wiedemann's specimen was evidently an undersized female. The present specimens measure 10 to 11 mm. The colour is golden-green, more or less cupreous; the abdomen with changeable pollen like *Pollenia rudis*, F., but greenish-gold. The male generic characters above are drawn from this species.

### **Pollenia, R. D.**

Genotype, *Musca rudis*, Fab.—Europe, Asia, North America (evidently introduced in last).

Facial carina acute, sharp, narrow; epistoma *Phasia*-like, very narrowed; arista plumose to tip; apical cell widely open; male eyes not contiguous, but rather closer together than length of second antennal joint, the frontalia practically pinched out;

male hypopygium not large, claws not long; macrochaetae bristle-like, long, suberect, marginal on last three segments, irregularly discal on anal segment; front tarsi of female widened, those of male not so; palpi club-shaped, not much flattened and not very stout; female with two proclinate and one reclinate fronto-orbitals, male with none of either.

### *Pollenia rudis*, F.

Two males, one between Yanghissar and Sinkol (Yarkand Exped.); the other Styria.

This species has been demonstrated by Keilin to be parasitic in earthworms in France. It has recently been reared by the U.S. Bureau of Entomology from earthworms in America.

### *Dexopollenia*, gen. nov.

Genotype, *Dexopollenia testacea*, sp. n.

Facial carina strong, wide and depressed, merged widely into epistoma; vibrissae but little above oral margin, the epistoma *Pollenia*-like, narrow; arista moderately plumose; apical cell narrowly open, the fourth vein curved much like that of *Pyrellia*; male eyes practically contiguous, the parafrontalia reduced to a line; male hypopygium rather large; macrochaetae bristle-like, erect, marginal on last three segments, lateral discals on all; front tarsi not widened in either sex; palpi subcylindrical; thorax with yellowish crinkled pile; parafacialia wide and bare.

### *Dexopollenia testacea*, sp. nov.

Length of body, 5.5 mm.; of wing, 6 mm. One male and one female, Assam-Bhutan Frontier, Mangaldai District, N.E., Jany. 1-2, 1911 (*S. W. Kemp*).

Fulvotestaceous, shaded to brown. Head with pale brown shading over face and cheeks; the parafrontalia dark brown, thinly silvery pollinose, leaving three main darker areas on vertex, middle, and opposite base of antennae, the vertical area not showing in male. Thorax and scutellum mostly brown; the scutum blackish, but showing some silvery pollen. Abdomen with hind borders of segments brown, the third and anal brown on posterior half, or anal wholly brown. Legs testaceous, tinged with brown; tarsi blackish. Wings clear. Tegulae smoky.

Holotype in Ind. Mus., female; allotype, male.

### *Polleniopsis*, gen. nov.

Genotype, *Polleniopsis pilosa*, sp. n.

Facial carina broad, flattened, rounded, reaching nearly to epistoma, the latter *Pollenia*-like, narrow and short; arista thickly plumose; apical cell moderately open, the fourth vein bent sud-

denly; male eyes nearly contiguous, the frontalia pinched out or only very narrowly showing; male hypopygium not very large, claws moderately elongate; macrochaetae bristle-like, much as in *Pollenia*; short straight pile of thorax black, longer on pleurae; no crinkled yellow pile; front tarsi normal in male; palpi subcylindrical; parafacialia moderately wide, more or less pilose above.

***Polleniopsis pilosa*, sp. nov.**

Length of body, 5 to 8 mm.; of wing, 5 to 8 mm. Two males: Darjiling, 6,000 ft., Sept. 21, 1908 (*E. Brunetti*); and Purneah, Bihar, August 5, 1907 (*C. Paiva*).

Brown to blackish, more or less silvery or ashy pollinose. Head pale brownish, the front darker; pollen silvery to ashy. Palpi fulvous to fulvorufous; third antennal joint subfulvous; frontalia light to dark brown. Mesoscutum with five black vittae, the middle one obsolete before suture in posterior view; the two inner ones before suture narrow in posterior view, but forming one wide vitta in anterior view. Abdomen tessellate much as in *Pollenia rudis*. Legs brown. Wings nearly clear, faintly tinged with smoky-yellowish especially on costa. Tegulae yellowish-smoky.

Holotype in Ind. Mus. Paratype, No. 21031 U.S. Nat. Mus.

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